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# Sport Fisheries of the Tongass and Chugach National Forests

## An Evaluation

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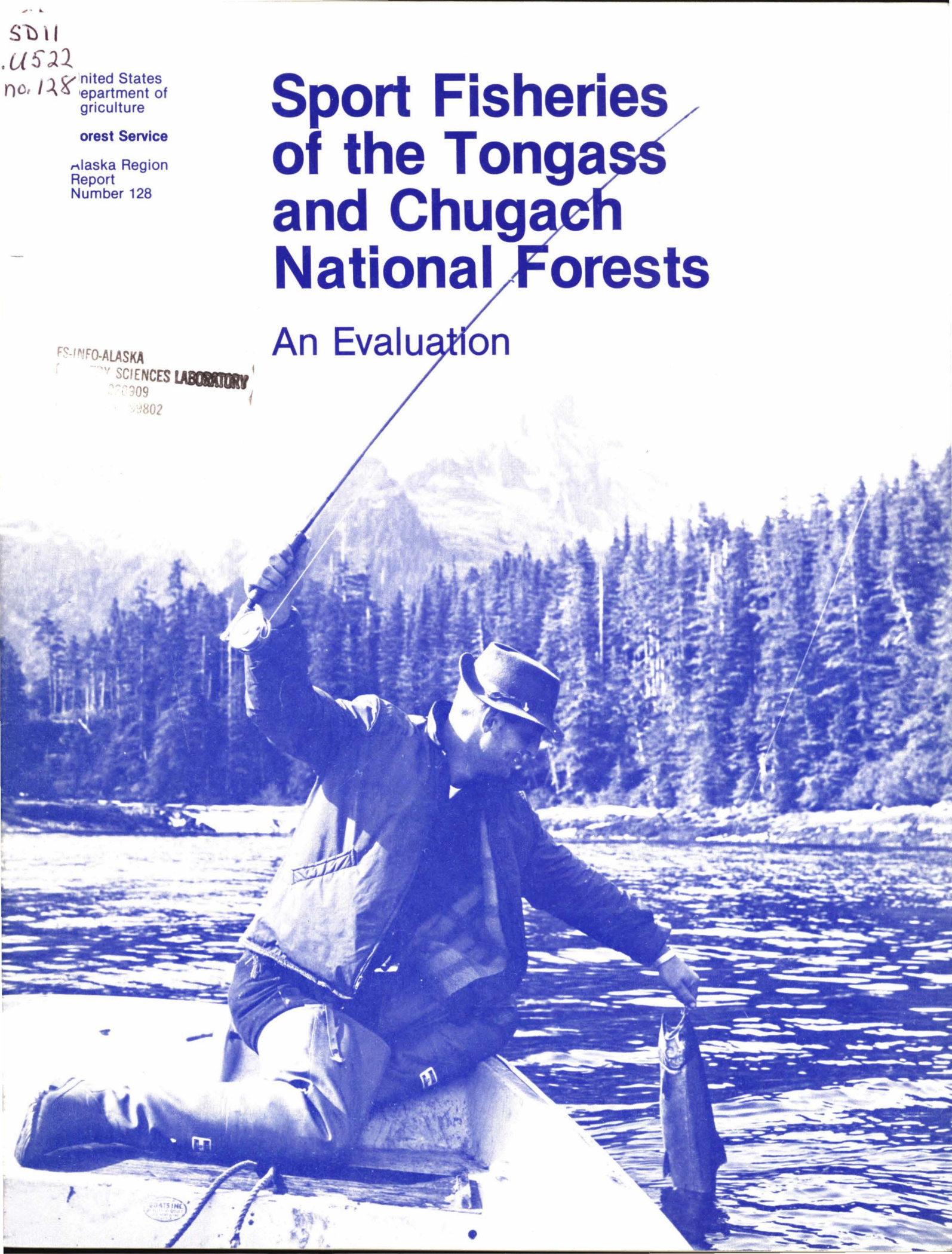

# SPORT FISHERIES OF THE TONGASS AND CHUGACH NATIONAL FORESTS: AN EVALUATION

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## BACKGROUND

Angling is one of America's most popular field sports and is also an important economic asset. Nationally, anglers invest more than $15.2 billion enjoying their sport each year (Everest and Summers, 1980).

In the United States, the National Forest System provides one of the greatest opportunities for public angling. This system, containing 190.8 million acres, spans 44 states. Despite the importance of angling in the National Forests, various comprehensive statistics on miles of streams, acres of lakes, and national use were not available in one report until Everest and Summers (1980) compiled such data.

Their need for data from the Alaska Region caused us to initiate an analysis of the above statistics in the Tongass and Chugach National Forests of R-10.

The Alaska Region contains some of the most remote and spectacular waters in the National Forest System. Fisheries of the area depend almost entirely upon anadromous and resident salmonids. Eleven species, including eight which are anadromous, provide high quality sport fishing in both fresh and salt water.

## OBJECTIVE

The objective of this report is to present an analysis of sport fisheries effort and harvest data for the Tongass and Chugach National Forests using the Alaska Department of Fish and Game's Statewide Harvest Studies for 1977, 1978, and 1979. This analysis will be used to help validate existing values for anadromous saltwater and freshwater sport fisheries, as well as resident freshwater sport fisheries. Initial values were determined from the nationwide USDA Forest Service 1980 Renewable Resource Planning Assessment (RPA).

## METHODS

We considered data from the Alaska Department of Fish and Game's (ADF&G's) Statewide Harvest Studies (Mills, 1979, 1980) for 1977, 1978, and 1979 as the best available use information regarding Alaska sport fisheries. These Harvest Studies combined postal surveys and creel censuses to obtain estimates of effort and harvest by fishery and by species. The postal surveys consisted of repeated mailings of questionnaires to random samples of Alaska sport fishing license holders. Creel censuses consisted of on-site interviews of random samples of sport fishermen. The postal surveys provided estimates for all fisheries, while creel censuses of major selected fisheries provided validity correction and check. Additional use information was gained through contact with personnel from the USDA Forest Service's Alaska Regional Office and Areas and the Alaska Department of Fish and Game.

Analysis entailed a breakdown of the sport fish angler-days by year and areas for the Tongass and Chugach National Forests. Areas reported in the ADF&G Harvest Studies that are part of the Tongass and Chugach National Forests were determined. Also, the salt and freshwater bays, rivers, and lakes that are habitats for

sport fish from the Forests were identified and angler-days recorded. When rivers and lakes were not readily identified, a percentage representing a best estimate of effort and harvest of sport fish produced on National Forest lands was used. Changes in federal land status and resulting impacts to data reported in the ADF&G's Harvest Studies were taken into account.

Sport fisheries were divided into three groups: saltwater anadromous fisheries, freshwater anadromous fisheries, and freshwater resident fisheries.

Saltwater anadromous fisheries were assumed to be salmonids that spawned on Forest Service land and were caught during the saltwater phase of their life cycles. Freshwater anadromous fisheries were assumed to be those species occurring in streams and lakes known for their anadromous fishing activities. All freshwater resident fish were assumed to be those species associated with landlocked lakes or river systems. Following Forest Service policy to evaluate sport fisheries use, angler-days were converted to Recreation Visitor Days (RVD's), where one RVD is equivalent to twelve hours of fishing effort. Since the ADF&G Harvest Studies reported fishing effort in angler-days, it was necessary to determine the average number of hours spent fishing per day (activity duration) to convert angler-days to its equivalent 12-hour RVD. Once accomplished, the total RVD's were computed by year and sport fisheries for each National Forest. It should be noted that due to the design of the ADF&G Harvest Study questionnaire, it was not always possible to determine angler-days for individual species. Therefore, total angler-day figures reported for each area were used to convert to RVD's.

The best available information for activity durations in the Tongass was provided by Forest Service Recreation Information Management (RIM) Systems data. These activity durations closely corresponded to data in annual reports by ADF&G, Division of Sport Fish. Activity durations in the annual reports were the most appropriate for the Chugach National Forest.

Activity durations are the following:

Tongass National Forest
Saltwater anadromous fishing = 5.4 hours per angler
Freshwater anadromous and resident fishing = 3.4 hours per angler

Chugach National Forest
Saltwater anadromous fishing = 4.8 hours per angler
Freshwater anadromous and resident fishing = 3.8 hours per angler

The formula used for conversion of angler-days to RVD's was:

(total angler-days)/(12-hour/activity duration)

Where:

total angler-days = total angler-days for fisheries reported in ADF&G Harvest Studies
12-hour = hours of fishing effort equivalent to one RVD
activity duration = average number of hours spent fishing per day

Comparison was made between RVD's using ADF&G Statewide Harvest Studies data and RVD's provided by the Forest Service RIM data. Since the RIM data were presented by Administrative Area (Ketchikan, Stikine, and Chatham) on the Tongass National Forest and were presented as a total for the Chugach National Forest, it was necessary to group ADF&G Harvest Studies data accordingly.

In the analysis, RVD's were used to determine sport fishery values by developing a multiplier using value per angler-day for saltwater anadromous sport fisheries and for freshwater anadromous/resident sport fisheries, separately. Values for angler-days were those derived in the Forest Service 1980 Renewable Resource Planning Assessment which were based on an angler's willingness to pay for the right to fish over and above the current cost of participation.[1] There were no values approved for 1977, 1978, and 1979. Therefore, values approved for 1980 had to be applied to each of those years (Everest, personal communication, February, 1981).

The multipliers were dependent upon the average duration of fishing per day. The most recent set of values for evaluation of recreation fishing in the Alaskan Region is listed below:

| Sport Fishery | Value per Angler-Day |
|---|---|
| Saltwater anadromous | $19.50 |
| Freshwater anadromous and resident | $ 5.25 |

The formula used to determine values was:

($)(12-hour/activity duration)

Where:

$ = value per day for the fishery
12-hour = hours of fishing effort equivalent to one RVD
activity duration = average number of hours spent fishing per day

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1/RPA cites the Water Resources Council's (FR72950) definition of unit day value. "The unit day value method relies on expert or informed opinion and judgment to estimate the average willingness to pay of recreation users. By applying a carefully thought-out and adjusted unit day value to estimated use, an approximation is obtained that may be used as an estimate of project recreation benefits." For more information on RPA's application of the unit day value, see pages 10-13 of Schweitzer, et al, 1980.

Using the above formula, values for sport fisheries of the Tongass and Chugach National Forests were determined as follows:

| Tongass National Forest | Value of RVD |
|---|---|
| Saltwater anadromous | $43.29 |
| Freshwater anadromous and resident | $18.53 |
| **Chugach National Forest** | |
| Saltwater anadromous | $48.75 |
| Freshwater anadromous and resident | $16.80 |

The above values were multiplied by the number of RVD's calculated from the ADF&G Harvest Studies to determine the total value of RVD's for both National Forests. Comparisons were made between the value of RVD's using ADF&G Harvest Studies data and the value of RVD's provided by the Forest Service RIM data.

## RESULTS

A list of the scientific and common names of the sport fish produced on National Forest lands that were considered in this report is in Appendix A. Tables showing angler-days, recreation visitor days (RVD's), and values are displayed in Appendix B. This section summarizes information concerning angling effort in RVD's, effort expended in the different types of sport fisheries (saltwater anadromous, freshwater anadromous, and freshwater resident) and the values of the sport fisheries for the Forests and various types of sport fishing. The purpose of the summaries is to show relative effort and values between fishery and forest. These summaries will not yield the correct daily use values per RVD discussed in the methods section. Appendix B shows the proper stratifications associated with the different activity durations for the various types of sport fisheries in each Forest.

Comparisons between ADF&G harvest data and Forest Service RIM data are displayed in Appendix C. Given also are summaries showing comparisons made between Forest Service RIM RVD's and RVD's computed from the ADF&G Harvest Studies and comparisons made between values based on RIM and ADF&G data.

### Effort in Recreation Visitor Days

Sport fish RVD's (based on ADF&G data) for 1977-1979 for the Tongass and Chugach National Forests follow. Percentages of the total RVD's per year are given in parentheses:

| | RVD's | | |
|---|---|---|---|
| | 1977 | 1978 | 1979 |
| Tongass | 97,943 (53%) | 91,054 (47%) | 92,657 (46%) |
| Chugach | 85,419 (47%) | 102,313 (53%) | 107,006 (54%) |
| Total | 183,362 | 193,367 | 199,663 |

The number and percent of total RVD's spent angling in specific sport fisheries each year follow:

| | RVD's | | |
|---|---|---|---|
| | 1977 | 1978 | 1979 |
| Saltwater anadromous | 111,517 (61%) | 110,708 (57%) | 117,861 (59%) |
| Freshwater anadromous | 65,315 (36%) | 77,579 (40%) | 76,606 (38%) |
| Freshwater resident | 6,530 ( 4%) | 5,080 ( 3%) | 5,196 ( 3%) |

## Value of Sport Fisheries

An estimated dollar value for sport fish angling utilizing fish produced on the Tongass and Chugach for 1977-1979 are given below. Percentages of the total estimated value per year are given in parentheses:

| | VALUE ($) | | |
|---|---|---|---|
| | 1977 | 1978 | 1979 |
| Tongass | 3,887,247 (63%) | 3,656,717 (57%) | 3,746,488 (56%) |
| Chugach | 2,323,857 (37%) | 2,714,581 (43%) | 2,944,450 (44%) |
| Total | 6,211,104 | 6,371,298 | 6,690,938 |

The estimated value and percent of total value for different types of fishing is:

| | VALUE ($) | | |
|---|---|---|---|
| | 1977 | 1978 | 1979 |
| Saltwater anadromous | 4,979,464 (80%) | 4,962,712 (78%) | 5,298,173 (79%) |
| Freshwater anadromous | 1,113,737 (18%) | 1,317,059 (21%) | 1,299,706 (19%) |
| Freshwater resident | 117,903 ( 2%) | 91,527 ( 1%) | 93,059 ( 1%) |

## DISCUSSION

Sport fisheries data for the Tongass and Chugach National Forests of Alaska indicate that angling effort has been increasing in the Region each year from 1977 to 1979. Even though angling effort has increased in the Region as a whole, comparison between the two Forests indicates that over the three years, the percent of total annual effort has decreased in the Tongass and increased in the Chugach. At present, this trend is not significant, but if it continues, further work may be necessary to determine its significance. Each year, over 90 per cent of the angling effort was expended fishing for anadromous salmonids and about 60 percent of the effort was spent angling in saltwater.

The annual estimated value of the Tongass and Chugach sport fisheries was over $6 million. This figure has increased each year in accordance with increases in angling effort. The highest valued fishery was the saltwater anadromous fishery, where about 80 percent of the total value was made each year. Over 95 percent of the total value each year was related to angling for anadromous salmonids.

Comparisons between ADF&G Statewide Harvest Studies and Forest Service RIM information show wide discrepensies (see Appendix C). The ratio of the

difference in RIM data to ADF&G Harvest Studies averaged about 2.2 to 1.0. Thus, the annual value of the sport fisheries based on RIM data was about twice as large as the value based on ADF&G Harvest Studies. The ADF&G Harvest Studies results have been consistent with ADF&G's on-going creel census programs for the same years, and are received well by the angling public. Overall response to the postal surveys was 76% in 1977, 69% in 1978, and 67% in 1979. The RIM data were determined primarily by observation, judgement, and the personal experience of the reporting personnel. In the interest of basing analysis and evaluation upon the best scientific information available, the ADF&G Statewide Harvest Studies provide the best information regarding Alaska sport fish use, given the success of the survey methodologies and the consistency with which these data conform to survey methodologies of other programs.

Even with the ADF&G information on Alaska sport fisheries effort and harvest, approximating the value of these fisheries as a nonmarket resource remains difficult, because the "value" must be estimated by indirect means. Daily use values employed in this report were the most recent values modified for use in the 1980 Renewable Resources Planning Assessment of the USDA Forest Service. However, the daily use value methodology is the least preferred method for determining economic value (Schweitzer, et al, 1980). The values of $19.50 per angler-day for saltwater anadromous fishing and $5.25 per angler-day for freshwater anadromous and resident fishing are highly conservative and undoubtedly understate the actual value of sport fisheries in the Tongass and Chugach. The figure for saltwater anadromous fishing was based on research results for Oregon and Washington which are more than ten years old. The figure for freshwater anadromous and resident fishing did not take into consideration the fact that most angling on National Forest lands in Alaska, especially on the Tongass, is accessible only by boat or plane. It is assumed that daily use values for these forms of travel are a higher value than access by ground transportation.

The need for more appropriate values grows continuously. Statewide interest is being generated to conduct studies to develop methodologies for economic analysis of sport fisheries in the Alaska Region. Preferred methodologies are the travel-cost method[2] and the contingent valuation or questionnaire method[3], but adequate studies based on these approaches are not available nationally and are presently non-existent for the Alaska Region. However, ADF&G is giving strong consideration to conducting economic analysis studies of Alaska sport fisheries.

The ADF&G Statewide Harvest Studies are being continued for subsequent years after 1979: reports on the data for the 1980 sport fishing season will be available sometime in 1981. Interest in the possibility of incorporating economic studies in these Statewide Harvest Studies, or conducting separate studies using the mailing lists developed for the Harvest Studies, is being discussed. Cooperative work between ADF&G and the University

of Alaska's Sea Grant Program has already begun to look at specific sport fisheries. For example, an economic analysis of sport fisheries along the Russian and Kenai Rivers will be conducted this summer and other studies are being planned. However, more comprehensive statewide studies are needed and should benefit the Forest Service greatly. These studies will assist the Forest Service's efforts to (1) develop a fishery value system and a benefit/cost system for fish habitat enhancement projects in Alaska, and (2) provide estimates to be used with economic values of forest commodities for determining resource allocations or trade-offs.

## RECOMMENDATIONS

1. Given inherent problems in using daily use values (current RPA values), we would like to restate concerns made by Everest and Summers (1974:4). The value of sport fisheries should be considered an index to value rather than an actual value. Furthermore, these values (indices) should not be viewed as equivalent to economic values determined for commodity outputs in making resource allocations. Rather, the Region should strive to determine a reasonable range of sport fishery values using various accepted methods of estimation. These values should then be used to measure the change in resource allocations (sensitivity) over the range of values calculated. This procedure minimizes the risk of direct comparisons between nonmarket and commodity values and allows the judgement of the decision makers and planners to be the primary guide in resource allocations.

2. The Forest Service should get further clarification on the freshwater streams and lakes sampled in the ADF&G Harvest Studies that are part of the Tongass and Chugach in an attempt to fine-tune data on effort and harvest of sport fish species produced on National Forest lands.

3. The Forest Service should get clarification on the differences between freshwater anadromous and freshwater resident fishing effort and harvest in Alaska sport fisheries.

4. Changes in land status resulting from passage of the

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2/RPA cites the Water Resources Council's (FR 72950) definition of the travel cost method. "The basic premise of the travel cost method is that per capita use of a recreation site will decrease as out-of-pocket and time costs of traveling to the site increase, other variables being constant. The travel cost method consists of deriving a demand curve by using the variable costs of travel and the value of time as proxies for price. This method may be applied to a site-specific study or a regional model" (Schweitzer, et al, 1980:9).

3/RPA cites the Water Resources Council's (FR 72950) definition of the contingent valuation method. "The contingent valuation method estimates benefits by directly asking individual households their willingness to pay for changes in recreation opportunities at a given site. Individual values may be aggregated by summing willingness to pay for all users in the study area. This method may be applied to a site-specific study or a regional model" (Schweitzer, et al, 1980:10).

Alaska National Interest Lands Conservation Act of 1980 will affect values determined for the Chugach, and, therefore, should be taken into consideration for subsequent years.

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# APPENDIX A

## Scientific and Common Names of the Sport Fish Produced on National Forest Land that were Considered in this Report

Table A-1: Scientific and Common Names of the Sport Fish Produced on National Forest Lands that were Considered in this Report

| Common Name | Scientific Name |
|---|---|
| Chinook salmon | *Oncorhynchus tshawytscha* (Walbaum) |
| Coho salmon | *Oncorhynchus kisutch* (Walbaum) |
| Sockeye salmon | *Oncorhynchus nerka* (Walbaum) |
| Kokanee salmon | *Oncorhynchus nerka* (Walbaum) |
| Pink salmon | *Oncorhynchus gorbuscha* (Walbaum) |
| Chum salmon | *Oncorhynchus keta* (Walbaum) |
| Steelhead | *Salmo gairdneri* Richardson |
| Rainbow trout | *Salmo gairdneri* Richardson |
| Cutthroat trout | *Salmo clarki* Richardson |
| Brook trout | *Salvelinus fontinalis* (Mitchell) |
| Dolly Varden | *Salvelinus malma* (Walbaum) |
| Lake trout | *Salvelinus namaycush* (Walbaum) |
| Arctic grayling | *Thymallus arcticus* (Pallas) |

# APPENDIX B

## Tables Showing Angler-Days, Recreation Visitor Days, and Values

Table B-1: Angler-Days by Year for Sport Fisheries of the Tongass and Chugach National Forests (Source: Mills, 1979, 1980, 1981)

| Tongass National Forest | Total Angler-Days 1977 | 1978 | 1979 | Total |
|---|---|---|---|---|
| Ketchikan | | | | |
| Saltwater | | | | |
| Anadromous | 41,860 | 35,261 | 36,219 | 113,340 |
| Freshwater | | | | |
| Anadromous | 7,201 | 3,985 | 3,315 | 14,501 |
| Resident | 6,679 | 3,726 | 3,490 | 13,895 |
| Prince of Wales Island | | | | |
| Saltwater | | | | |
| Anadromous | 6,015 | 10,619 | 7,955 | 24,589 |
| Freshwater | | | | |
| Anadromous | 5,466 | 4,717 | 5,769 | 15,952 |
| Resident | 562 | 1,142 | 362 | 2,066 |
| Petersburg-Wrangell | | | | |
| Saltwater | | | | |
| Anadromous | 19,378 | 21,368 | 18,266 | 59,012 |
| Freshwater | | | | |
| Anadromous | 6,612 | 3,404 | 4,087 | 14,103 |
| Resident | 1,222 | 969 | 1,053 | 3,244 |
| Sitka | | | | |
| Saltwater | | | | |
| Anadromous | 30,817 | 27,638 | 36,564 | 95,019 |
| Freshwater | | | | |
| Anadromous | 3,480 | 2,741 | 1,902 | 8,123 |
| Resident | 3,447 | 2,562 | 2,044 | 8,053 |
| Juneau | | | | |
| Saltwater | | | | |
| Anadromous | 81,303 | 72,568 | 76,855 | 230,726 |
| Freshwater | | | | |
| Anadromous | 6,845 | 6,139 | 4,858 | 17,842 |
| Resident | 4,231 | 3,123 | 3,322 | 10,676 |
| Haines-Skagway | | | | |
| Saltwater | | | | |
| Anadromous | 5,594 | 8,035 | 5,203 | 18,832 |
| Freshwater | | | | |
| Anadromous | 1,964 | 1,465 | 896 | 4,325 |
| Resident | 453 | 1,056 | 283 | 1,792 |

| | | | | |
|---|---|---|---|---|
| Yakutat | | | | |
| Saltwater | | | | |
| Anadromous | 842 | 1,098 | 911 | 2,851 |
| Freshwater | | | | |
| Anadromous | 4,951 | 5,535 | 5,109 | 15,595 |
| Resident | 86 | 0 | 173 | 259 |
| TOTAL | 239,008 | 217,151 | 218,636 | 674,795 |
| Chugach National Forest | | | | |
| Prince William Sound | | | | |
| Saltwater | | | | |
| Anadromous | 19,423 | 12,687 | 33,939 | 66,049 |
| Freshwater | | | | |
| Anadromous | 25,402 | 20,356 | 8,002 | 53,760 |
| Resident | 0 | 0 | 0 | 0 |
| Kenai Peninsula | | | | |
| Saltwater | | | | |
| Anadromous | 50,126 | 65,224 | 55,790 | 171,140 |
| Freshwater | | | | |
| Anadromous | 153,189 | 202,500 | 213,599 | 569,288 |
| Resident | 5,729 | 4,818 | 5,963 | 16,510 |
| TOTAL | 253,869 | 305,585 | 317,293 | 876,747 |
| GRAND TOTAL | 492,877 | 522,736 | 535,929 | 1,551,542 |

Table B-2: Recreation Visitor Days by Year for Sport Fisheries of the Tongass and Chugach National Forests (Source: Derived from Mills, 1979, 1980, 1981)

| Tongass National Forest | Recreation Visitor Days 1977 | 1978 | 1979 | Total |
|---|---|---|---|---|
| Ketchikan | | | | |
| Saltwater | | | | |
| Anadromous | 18,856 | 15,883 | 16,315 | 51,054 |
| Freshwater | | | | |
| Anadromous | 1,200 | 1,139 | 947 | 3,286 |
| Resident | 1,908 | 1,065 | 1,283 | 4,256 |
| Prince of Wales Island | | | | |
| Saltwater | | | | |
| Anadromous | 2,709 | 4,783 | 3,583 | 11,075 |
| Freshwater | | | | |
| Anadromous | 1,548 | 1,336 | 1,634 | 4,518 |
| Resident | 159 | 324 | 103 | 586 |
| Petersburg-Wrangell | | | | |
| Saltwater | | | | |
| Anadromous | 8,729 | 9,625 | 8,228 | 26,582 |
| Freshwater | | | | |
| Anadromous | 1,873 | 964 | 1,158 | 3,995 |
| Resident | 346 | 275 | 298 | 919 |
| Sitka | | | | |
| Saltwater | | | | |
| Anadromous | 13,882 | 12,450 | 16,470 | 42,802 |
| Freshwater | | | | |
| Anadromous | 986 | 776 | 539 | 2,301 |
| Resident | 976 | 726 | 579 | 2,281 |
| Juneau | | | | |
| Saltwater | | | | |
| Anadromous | 36,623 | 32,688 | 34,619 | 103,930 |
| Freshwater | | | | |
| Anadromous | 1,939 | 1,739 | 1,376 | 5,054 |
| Resident | 1,199 | 885 | 941 | 3,025 |
| Haines-Skagway | | | | |
| Saltwater | | | | |
| Anadromous | 2,520 | 3,619 | 2,344 | 8,483 |
| Freshwater | | | | |
| Anadromous | 556 | 415 | 254 | 1,225 |
| Resident | 128 | 299 | 80 | 507 |

| | | | | |
|---|---|---|---|---|
| Yakutat | | | | |
| Saltwater | | | | |
| Anadromous | 379 | 495 | 410 | 1,284 |
| Freshwater | | | | |
| Anadromous | 1,403 | 1,568 | 1,447 | 4,418 |
| Resident | 24 | 0 | 49 | 73 |
| TOTAL | 97,943 | 91,054 | 92,657 | 281,654 |
| Chugach National Forest | | | | |
| Prince William Sound | | | | |
| Saltwater | | | | |
| Anadromous | 7,769 | 5,075 | 13,576 | 26,420 |
| Freshwater | | | | |
| Anadromous | 7,938 | 6,361 | 2,501 | 16,800 |
| Resident | 0 | 0 | 0 | 0 |
| Kenai Peninsula | | | | |
| Saltwater | | | | |
| Anadromous | 20,050 | 26,090 | 22,316 | 68,456 |
| Freshwater | | | | |
| Anadromous | 47,872 | 63,281 | 66,750 | 177,903 |
| Resident | 1,790 | 1,506 | 1,863 | 5,159 |
| TOTAL | 85,419 | 102,313 | 107,006 | 294,738 |
| GRAND TOTAL | 183,362 | 193,367 | 199,663 | 576,392 |

Table B-3: Value ($) of Angling by Year for Sport Fisheries of the Tongass and Chugach National Forests (Source: Derived from Mills, 1979, 1980, 1981)

| Tongass National Forest | VALUE ($) 1977 | 1978 | 1979 | Total |
|---|---|---|---|---|
| Ketchikan | | | | |
| Saltwater | | | | |
| Anadromous | 816,276 | 687,575 | 706,276 | 2,210,127 |
| Freshwater | | | | |
| Anadromous | 22,236 | 21,106 | 17,548 | 60,890 |
| Resident | 35,355 | 19,734 | 23,774 | 78,863 |
| Prince of Wales Island | | | | |
| Saltwater | | | | |
| Anadromous | 117,273 | 207,056 | 155,108 | 479,437 |
| Freshwater | | | | |
| Anadromous | 28,684 | 24,756 | 30,278 | 83,718 |
| Resident | 2,946 | 6,004 | 1,909 | 10,859 |
| Petersburg-Wrangell | | | | |
| Saltwater | | | | |
| Anadromous | 377,878 | 416,666 | 356,190 | 1,150,734 |
| Freshwater | | | | |
| Anadromous | 34,707 | 17,863 | 21,458 | 74,028 |
| Resident | 6,411 | 5,096 | 5,522 | 17,029 |
| Sitka | | | | |
| Saltwater | | | | |
| Anadromous | 600,952 | 538,961 | 712,986 | 1,852,899 |
| Freshwater | | | | |
| Anadromous | 18,271 | 14,379 | 9,988 | 42,638 |
| Resident | 18,085 | 13,453 | 10,729 | 42,267 |
| Juneau | | | | |
| Saltwater | | | | |
| Anadromous | 1,585,410 | 1,415,064 | 1,498,657 | 4,499,131 |
| Freshwater | | | | |
| Anadromous | 35,930 | 32,224 | 25,497 | 93,651 |
| Resident | 22,217 | 16,399 | 17,437 | 56,053 |
| Haines-Skagway | | | | |
| Saltwater | | | | |
| Anadromous | 109,091 | 156,667 | 101,472 | 367,230 |
| Freshwater | | | | |
| Anadromous | 10,303 | 7,690 | 4,707 | 22,700 |
| Resident | 2,372 | 5,540 | 1,482 | 9,394 |

| | | | | |
|---|---|---|---|---|
| Yakutat | | | | |
| Saltwater | | | | |
| Anadromous | 16,407 | 21,429 | 17,749 | 55,585 |
| Freshwater | | | | |
| Anadromous | 25,998 | 29,055 | 26,813 | 81,866 |
| Resident | 445 | 0 | 908 | 1,353 |
| TOTAL | 3,887,247 | 3,656,717 | 3,746,488 | 11,290,452 |
| Chugach National Forest | | | | |
| Prince William Sound | | | | |
| Saltwater | | | | |
| Anadromous | 378,739 | 247,406 | 661,830 | 1,287,975 |
| Freshwater | | | | |
| Anadromous | 133,358 | 106,865 | 42,017 | 282,240 |
| Resident | 0 | 0 | 0 | 0 |
| Kenai Peninsula | | | | |
| Saltwater | | | | |
| Anadromous | 977,438 | 1,271,888 | 1,087,905 | 3,337,230 |
| Freshwater | | | | |
| Anadromous | 804,250 | 1,063,121 | 1,121,400 | 2,988,770 |
| Resident | 30,072 | 25,301 | 31,298 | 86,671 |
| TOTAL | 2,323,857 | 2,714,581 | 2,944,450 | 7,982,888 |
| GRAND TOTAL | 6,211,104 | 6,371,298 | 6,690,938 | 19,273,340 |

Table C-1: Comparison by Year of RVD's Derived from ADF&G Angler-Days with RVD's from Forest Service RIM Data

| | Recreation Visitor Days | | | | | |
|---|---|---|---|---|---|---|
| | 1977 | | 1978 | | 1979 | |
| Tongass National Forest | ADF&G | RIM | ADF&G | RIM | ADF&G | RIM |
| Ketchikan Area (Ketchikan, Prince of Wales Island) | | | | | | |
| Saltwater | 21,565 | 10,700 | 20,666 | 11,200 | 19,898 | 12,800 |
| Freshwater | 4,815 | 19,000 | 3,864 | 19,900 | 3,967 | 22,200 |
| Stikine Area (Petersburg-Wrangell) | | | | | | |
| Saltwater | 8,729 | 132,200 | 9,625 | 160,000 | 8,228 | 165,000 |
| Freshwater | 2,219 | 34,200 | 1,239 | 50,800 | 1,456 | 23,400 |
| Chatham Area (Sitka, Juneau, Haines-Skagway, Yakutat) | | | | | | |
| Saltwater | 53,404 | 66,000 | 49,252 | 68,500 | 53,843 | 290,000 |
| Freshwater | 7,211 | 41,700 | 6,408 | 29,800 | 5,265 | 43,500 |
| TOTAL | 97,943 | 303,800 | 91,054 | 340,200 | 92,657 | 556,900 |
| Chugach National Forest | | | | | | |
| (Prince William Sound, Kenai Peninsula) | | | | | | |
| Saltwater | 27,819 | 7,000 | 31,165 | 1,000 | 35,892 | 8,500 |
| Freshwater | 57,600 | 19,800 | 71,148 | 37,600 | 71,114 | 32,600 |
| TOTAL | 85,419 | 26,800 | 102,313 | 38,600 | 107,006 | 41,100 |
| GRAND TOTAL | 183,362 | 330,600 | 193,367 | 378,800 | 199,663 | 598,000 |

Table C-2: Comparison of Value ($) of RVD's by Year Using ADF&G Statewide Harvest Studies and RVD's Provided by Forest Service RIM Data

| | VALUE ($) | | | | | |
|---|---|---|---|---|---|---|
| | 1977 | | 1978 | | 1979 | |
| Tongass National Forest | ADF&G | RIM | ADF&G | RIM | ADF&G | RIM |
| Ketchikan Area (Ketchikan, Prince of Wales Island) | | | | | | |
| Saltwater | 933,549 | 463,203 | 894,631 | 484,848 | 861,384 | 554,112 |
| Freshwater | 89,221 | 352,070 | 71,600 | 368,747 | 73,509 | 411,366 |
| Stikine Area (Petersburg-Wrangell) | | | | | | |
| Saltwater | 377,878 | 5,722,938 | 416,666 | 6,926,400 | 356,190 | 7,142,850 |
| Freshwater | 41,118 | 633,726 | 22,959 | 941,324 | 26,980 | 433,602 |
| Chatham Area (Sitka, Juneau, Haines-Skagway, Yakutat) | | | | | | |
| Saltwater | 2,311,860 | 2,857,140 | 2,132,119 | 2,965,365 | 2,330,863 | 12,554,100 |
| Freshwater | 133,621 | 772,701 | 118,740 | 552,194 | 97,560 | 806,055 |
| TOTAL | 3,887,247 | 10,801,778 | 3,656,715 | 12,238,878 | 3,736,486 | 21,902,085 |
| Chugach National Forest (Prince William Sound, Kenai Peninsula) | | | | | | |
| Saltwater | 1,356,177 | 341,250 | 1,519,294 | 48,750 | 1,749,735 | 414,375 |
| Freshwater | 967,680 | 332,640 | 1,195,286 | 631,680 | 1,194,715 | 547,680 |
| TOTAL | 2,323,857 | 673,890 | 2,714,580 | 680,430 | 2,944,450 | 962,055 |
| GRAND TOTAL | 6,211,104 | 11,475,668 | 6,371,295 | 12,919,308 | 6,690,936 | 22,864,140 |

Table C-3: Summaries of Comparisons of Data Derived form ADF&G Harvest Studies with Forest Service RIM Data

Comparisons between Forest Service RIM Recreation Visitor Days and Recreation Visitor Days Computed from ADF&G Harvest Studies

Comparisons made between sport fish RVD's derived from ADF&G Harvest Studies and sport fish RVD's provided by Forest Service RIM data for 1977-1979 for the Tongass and Chugach follow. The percent of the total RVD's per year for each Forest is given in parentheses:

| | | RVD's | | |
|---|---|---|---|---|
| | | Tongass | Chugach | Total |
| 1977 | ADF&G | 97,943 (53%) | 85,419 (47%) | 183,362 |
| | RIM | 303,800 (92%) | 26,800 ( 8%) | 330,600 |
| 1978 | ADF&G | 91,054 (47%) | 102,313 (53%) | 193,367 |
| | RIM | 340,200 (90%) | 38,600 (10%) | 378,800 |
| 1979 | ADF&G | 92,657 (46%) | 107,006 (54%) | 199,663 |
| | RIM | 556,900 (93%) | 41,100 ( 7%) | 598,000 |

The number and percent of total RVD's spent angling in specific sport fisheries each year are compared as follows:

| | | RVD's | |
|---|---|---|---|
| | | Saltwater | Freshwater |
| 1977 | ADF&G | 111,517 (61%) | 71,845 (39%) |
| | RIM | 215,900 (65%) | 114,700 (35%) |
| 1978 | ADF&G | 110,708 (57%) | 82,659 (43%) |
| | RIM | 240,700 (64%) | 138,100 (36%) |
| 1979 | ADF&G | 117,861 (59%) | 81,802 (41%) |
| | RIM | 476,300 (80%) | 121,700 (20%) |

## Comparisons between Values of Sport Fisheries Using Forest Service RIM Data and Values Using ADF&G Data

Comparisons made between as estimated dollar value for sport fish angling using values computed from ADF&G Harvest Studies and values derived from Forest Service RIM data for 1977-1979 by National Forest follow. Percentages of the total estimated value per year are given in parentheses:

| | | VALUE ($) | | |
|---|---|---|---|---|
| | | Tongass | Chugach | Total |
| 1979 | ADF&G | 3,887,247 (63%) | 2,887,857 (37%) | 6,211,104 |
| | RIM | 10,801,778 (94%) | 673,890 ( 6%) | 11,475,668 |
| 1978 | ADF&G | 3,656,717 (57%) | 2,714,581 (43%) | 6,371,298 |
| | RIM | 12,238,878 (95%) | 680,430 ( 5%) | 12,919,308 |
| 1979 | ADF&G | 3,746,488 (56%) | 2,944,450 (44%) | 6,690,938 |
| | RIM | 21,902,085 (96%) | 962,055 ( 4%) | 22,864,140 |

Comparison of the RIM and ADF&G derived values and percent of total value for different types of fishing, 1977-1979:

| | | VALUE ($) | |
|---|---|---|---|
| | | Saltwater | Freshwater |
| 1977 | ADF&G | 4,979,464 (80%) | 1,231,640 (20%) |
| | RIM | 9,384,531 (82%) | 2,091,137 (18%) |
| 1978 | ADF&G | 4,962,712 (78%) | 1,408,586 (22%) |
| | RIM | 10,425,363 (81%) | 2,493,945 (19%) |
| 1979 | ADF&G | 5,298,173 (79%) | 1,392,765 (21%) |
| | RIM | 20,665,437 (90%) | 2,198,703 (10%) |

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